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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,675	11/18/2003	Hiroki Taoka	82478-2300	4812

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EXAMINER	
HAJNIK, DANIEL F	
ART UNIT	PAPER NUMBER
2628	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/715,675	TAOKA ET AL.	
	Examiner	Art Unit	
	Daniel F. Hajnik	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Betrisey et al. (US Patent 6738526) in view of Hill et al. (US Patent 6577291).

As per claim 1, Betrisey teaches the claimed:

1. A display apparatus for displaying an image on a display device *(col 10, line 61, "Liquid crystal display device")* which includes rows of pixels *(col 8, line 39, "rows R(N), R(N+1), R(N+2)" and the rows shown in figure 6)*, each pixel composed of three sub-pixels that align in a lengthwise direction *(col 8, lines 52-54, "each one of the source image segments 622, 623, 624 is over-sampled in the direction perpendicular to the RCB striping" where over-sampling can create sub-pixels and the sub-pixels are also shown in figure 6)* of the pixel rows and emit light

of three primary colors respectively *(col 13, lines 53-54, "the R, G, and B pixel sub-component luminous intensity values")*, the display apparatus comprising:

a front image storage unit operable to store color values of sub-pixels that constitute a front image to be displayed on the display device *(col 12, lines 9-10, "Portions of a character within a character outline represent foreground image areas" and col 13, line 9, "foreground ... color selections" and col 13, lines 22-23, "display buffer 825")*;

a superimposing unit *(col 26, line 50, "the color blending step 2304")* operable to generate, from color values of the front image stored in the front image storage unit and color values of an image currently displayed on the display device, color values of sub-pixels constituting a composite image of the front image and the currently displayed image *(col 27, lines 59-64, "The term compositing is used to refer to a color blending operation which involves the use of a background image to supply the background color luminous intensity values used in the blending operation. In step 2404, foreground and background colors are applied")*;

a displaying unit *(col 10, line 61, "Liquid crystal display device 754")* operable to display the composite image based on the color values thereof after the smoothing out *(col 28, lines 23-25, "The gamma corrected RGB luminous intensity values are stored in the display buffer 1314 for use in controlling the display device to display the intended character images")*.

Betrisey does not explicitly teach the remaining claim limitations:

Hill suggests the claimed:

a calculation unit operable to calculate a dissimilarity level of a target sub-pixel to one or more sub-pixels that are adjacent to the target sub-pixel in the lengthwise direction of the pixel rows *(col 19, lines 44-46, "A red/green difference intensity value is determined and compared to a threshold value")*, from color values of first-target-range sub-pixels *(figure 9C, step 976 where the threshold can indicate a target range and figure 9D, step 993)* composed of the target sub-pixel and the one or more adjacent sub-pixels stored in the front image storage unit *(where figure 7B shows the Red and Green color components adjacently located)*;

Hill teaches the claimed:

a filtering unit operable to smooth out color values of second-target-range subpixels of the composite image that correspond to the first-target-range sub-pixels *(col 19, lines 4-10, "adjusting the luminous intensity of pixel sub-components of distracting pixels may involve (1) subtracting some luminous intensity from bright pixel sub-components and/or (2) adding some luminous intensity, e.g., the amount that was subtracted in (1), to an adjacent, different colored pixel sub-component, e.g., a neighboring pixel sub-component of the same pixel" where adjusting the luminance is filtering)*, by assigning weights, which are determined in accordance with the dissimilarity level, to the second-target range sub-pixels *(col 17, lines 61-65, "weighted scaling technique discussed above, the first three segments of each pixel area of the scaled image are used to determine the luminous intensity value of a red pixel sub-component corresponding to a pixel in the bitmap image" and where the filtered pixels color are in an acceptable second-target range, also see figure 9D, step 995)*;

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Betrisey and Hill, because Betrisey and Hill are analogous art. Further, Hill teaches one advantage of the combination by teaching of "Performing steps (1) and/or (2) in accordance with the color compensation techniques of the present invention reduces color artifacts and thus color distractions" (col 19, lines 10-13), where Betrisey can benefit from the added functionality.

As per claim 2, Betrisey does not teach the claimed limitations.

Hill suggests the claimed:

2. The display apparatus of Claim 1, wherein the calculation unit calculates a temporary dissimilarity level for each combination of the first-target-range sub-pixels, from color values of the first-target-range subpixels, and regards a largest temporary dissimilarity level among results of the calculation to be the dissimilarity level *(where in figure 9C, a loop is shown where different comparisons of each red green pixels for each row can be tested).*

One advantage to particularly using the claimed maximum value would be to quickly focus on smoothing the largest intensity dissimilarities.

As per claim 3, Betrisey does not explicitly teach the claimed limitations.

Hill teaches the claimed:

3. The display apparatus of Claim 2, wherein

the first-target-range sub-pixels and the second-target-range sub-pixels are identical with each other in number and positions in the display device *(in figure 7B where the layout of sub-pixels or pixels is shown, further figure 9D indicates the first-target-range sub pixels in step 993*

where a threshold is tested, and if filtering is required, figure 9D also indicated the second-target-range sub pixels in step 995 where the sub-pixels or pixels are adjusted to an acceptable range where these adjusted pixels are in the same located in the grid as shown in figure 7B).

One advantage to using the claimed feature is that this correspondence is number and location makes intuitive sense and makes for straightforward filter implementation.

As per claim 4, Betrisey does not teach the claimed limitations.

Hill teaches the claimed:

4. The display apparatus of Claim 1, wherein

the filtering unit performs the smoothing out of the second-target-range sub-pixels if the dissimilarity level calculated by the calculation unit is greater than a predetermined threshold value, and does not perform the smoothing out if the calculated dissimilarity level is no greater than the predetermined threshold value *(col 19, lines 44-46, "A red/green difference intensity value is determined and compared to a threshold value", also see figure 9C, step 976).*

It would have been obvious to one of ordinary skill in the art to combine this teaching of Hill with Betrisey. The motivation of claim 1 is incorporated herein.

As per claim 5, the reasons and rationale for the rejection of claim 1 is incorporated herein. Betrisey teaches the claimed "Transparency values" by teaching of "*alpha values*" (col 26, line 45).

As per claims 6-8, these claims are similar in scope to claims 2-4, respectively, and are rejected under the same rationale.

As per claims 9 and 10, these claims are similar in scope to claims 1 and 5, respectively, and are rejected under the same rationale.

As per claim 11, the reasons and rationale for the rejection of claim 1 is incorporated herein. Betrisey teaches the claimed "computer-readable recording medium" *(col 10, lines 8-10, "The personal computer 720 may include ... a system memory 722").*

As per claim 12, the reasons and rationale for the rejection of claim 5 is incorporated herein. Betrisey teaches the claimed "computer-readable recording medium" *(col 10, lines 8-10, "The personal computer 720 may include ... a system memory 722").*

4. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Betrisey in view of Hill in further view of Ohta et al. (US Pub 2003/0090494).

As per claim 13, the reasons and rationale for the rejection of claim 1 is incorporated herein. Betrisey does not explicitly teach the claimed:

Ohta teaches the claimed:

a second sub-pixel emitting the same primary color as the target sub-pixel with a second color value associated with it, wherein the second sub-pixel is adjacent to the target subpixel in

the lengthwise direction of the pixel rows in the front image *(paragraph [0047], "two pixels horizontally adjacent to the target pixel" where one of these two adjacent pixels can be a second sub-pixel and [0047], "the process is carried out for each R, G, and B, separately" thus the two adjacent pixels for a given comparison in the process will have the same primary color because each is processed separately)*;

a calculation unit operable to calculate a dissimilarity level of the target sub-pixel and at least one second sub-pixel using the first color value and the second color value *([0047], "to calculate a difference v in color information between two pixels vertically adjacent to the target pixel and a difference h in color information between two pixels horizontally adjacent to the target pixel (step S203). At this time, when the color information of each pixel is represented by the RGB system, difference calculation is made for each of these R, G, and B, separately")*;

a third sub-pixel emitting the same primary color as the target sub-pixel with a third color value associated with it, wherein the third sub-pixel is located in the composite image and the third sub-pixel corresponds in location with the target sub-pixel *(paragraph [0047], "two pixels horizontally adjacent to the target pixel" where one of these two adjacent pixels can be a third sub-pixel and [0047], "the process is carried out for each R, G, and B, separately" thus the two adjacent pixels for a given step in the process will have the same primary color because each is processed separately)*;

a filtering unit operable to smooth out the color value of the third sub-pixel, by assigning a weight to the color value of the third sub-pixel, wherein the weight is determined in accordance with the dissimilarity level *(abstract, "The, for every pixel, the original image and a blurred original image are blended according to the corner's degree" and [0047], "Each difference is calculated based on values of the color information on a scale from 0 (minimum) to 1 (maximum)" where these value can be a weight associated with the color difference level)*;

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Betrisey, Hill, and Ohta, because Betrisey, Hill, and Ohta are analogous art. Further, Ohta teaches one advantage of the combination by teaching of "an image processing apparatus capable of generating a clear image not having conspicuous jaggies without requiring a large memory capacity or imposing a large processing load" ([0010]).

As per claim 14, this claim is similar in scope to claims 1 and 13, and thus is rejected under the same rationale.

Response to Arguments

5. Applicant's arguments filed 12/15/2006 have been fully considered but they are not persuasive.

Applicant argues Hill does not teach or suggest a filtering unit because in the sub-routine in 970, only the current pixel is analyzed and if the dissimilarity level is too high, then the pixel itself is modified. Applicant's argues the difference is that in applicant's invention, if the

dissimilarity level is too high, the pixel of the composite image is modified (pages 17-19 of remarks).

The examiner maintains that the rejections are proper because Hill teaches of filtering (*col 19, lines 4-10, "adjusting the luminous intensity of pixel sub-components of distracting pixels may involve (1) subtracting some luminous intensity from bright pixel sub-components and/or (2) adding some luminous intensity, e.g., the amount that was subtracted in (1), to an adjacent, different colored pixel sub-component, e.g., a neighboring pixel sub-component of the same pixel" where adjusting the luminance is filtering).* Further, the claim as a whole, is rejected based on the combination of references where Betrisey is relied for the actual superimposing or compositing. Thus, when one of ordinary skill applies the filtering of Hill, one could achieve the claimed limitations by applying the blending or modifying to the composite image rather than the pixel itself because Betrisey has a composite image pixels *(col 27, lines 59-64, "The term compositing is used to refer to a color blending operation which involves the use of a background image to supply the background color luminous intensity values used in the blending operation. In step 2404, foreground and background colors are applied").* Furthermore, such process is actually suggested by Betrisey *(col 17, lines 60-64, "Once foreground/background is applied to the filtered alpha values using blending techniques, and gamma correction is performed, the resulting gamma corrected R, G, and B luminous intensity values are stored").*

Applicant further argues in the reference of Hill, only the red and green color sub-pixels are compared to each other and that the red and green sub-pixels are not adjacent to each other in a lengthwise direction of the pixel rows (bottom of page 20 and page 21). The examiner

maintains that the prior art rejections are proper because accordingly to figure 7B, the Red and Green color values are adjacent and located next to each other. Further, these Red and Green color values are located in the same column to each other. Thus, the obviousness type rejection is proper because merely arranging the neighboring Red and Green color values to be in the same row or column is an obvious variation of the cited prior art. This is because the color components are still aligned next to each other in both configurations.

Applicant further argues that there is no motivation to combine Betrisey and Hill (pages 21 and 22 of remarks). The examiner contends that it would have been obvious to combine these references and that the combination is not reasonable for one of ordinary skill in the art to achieve. For one, the references are analogous art in that they both are addressed to very similar areas of technology, which is analyzing and filtering colored pixels on a display. Further, there are provided advantages and additional features Hill where these can add the to the capabilities of the system of Betrisey. For example, in the rejections above the motivation provided by Hill *(col 19, lines 10-13 , "Performing steps (1) and/or (2) in accordance with the color compensation techniques of the present invention reduces color artifacts and thus color distractions").*

Applicant further argues that there are no transparency values in Betrisey (pages 22 and 23). The examiner maintains that the prior art rejections are proper in regards to the claimed transparency values because the transparency values are not actually required by the claim language. More specifically, the claimed calculation unit and filtering unit requires at least one of color values and/or transparent value both is not required to have both. Furthermore, Betrisey suggests using transparency values in the calculation and filtering process *(col 17, lines 60-64,*

"Once foreground/background is applied to the filtered alpha values using blending techniques, and gamma correction is performed, the resulting gamma corrected R, G, and B luminous intensity values are stored").

Applicant's arguments with respect to claims 13 and 14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel F. Hajnik whose telephone number is (571) 272-7642. The examiner can normally be reached on Mon-Fri (8:30A-5:00P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka J. Chauhan can be reached on (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

D. F. 3/1/07

DFH

ULKA CHAUHAN
SUPERVISORY PATENT EXAMINER